

## **REMARKS**

Favorable reconsideration is respectfully requested in view of the foregoing amendments and the following remarks.

### **I. CLAIM STATUS**

Claims 1-4 were pending in this application when last examined and stand rejected.

Claims 1-4 have been cancelled without prejudice or disclaimer thereto and replaced with new claims 5-7. Applicants reserve the right to file a continuation or divisional on any cancelled subject matter.

Support for new claim 5 can be found in the disclosure, for example, at page 2, lines 9-15, page 3, lines 12-17, page 4, lines 5-13, page 5, the beginning of the first paragraph, and in original claim 1.

Support for new claim 6 can be found in original claim 2.

Support for new claim 7 can be found in original claim 3.

No new matter has been added by the above claim amendments.

Claims 5-7 are pending upon entry of this amendment.

The specification has been amended at page 1, lines 12-17, to spell out the acronyms "SFQ" and "SQUID" at their first occurrence in the specification based on the support in the disclosure and the common names used for these terms in the art field. No new matter has been added.

### **II. FOREIGN PRIORITY ACKNOWLEDGEMENT**

In item 1 on page 2 of the Office Action, the Examiner acknowledged receipt of the foreign priority documents. However, the Office did not indicate such, nor acknowledge receipt of the certified copies of the foreign priority documents, on the Office Action Summary form (item 12(a)). Kindly acknowledge such in the next Office Action.

### **III. OBJECTIONS TO THE SPECIFICATION**

In items 4-5 on page 2 of the Office Action, the specification was objected to the Specification for containing minor informalities.

It is respectfully submitted that the present amendment overcomes these objections. In particular, the specification has been amended at page 1, lines 12-17, to spell out the acronyms "SFQ" and "SQUID" at their first occurrence in the specification. Based on the guidance in the disclosure and the knowledge in the art, it is clear that the term "SFQ device" corresponds to a "single-flux-quantum" device. Likewise, it is clear that the term "SQUID" corresponds to a "superconducting quantum interference device".

Therefore, the objections to the specification are untenable and should be withdrawn.

### **IV. OBJECTIONS TO THE CLAIMS**

In item 6 on page 3 of the Action, claims 1-4 were objected on the basis that they fail to include a preamble in the independent claim.

It is respectfully submitted that the present amendment overcomes these objections. As noted above, claims 4-7 have been cancelled and replaced with new claims 5-7. It is noted that new independent claim 5 contains a preamble.

Therefore, the objections to the claims are untenable and should be withdrawn.

### **V. ANTICIPATION REJECTION & DOUBLE PATENTING REJECTION**

In item 8 on page 3 of the Action, claims 1-4 were rejected under 35 U.S.C. § 102(b) as anticipated by Takano et al. (U.S. Application No. 2002/0025586) (hereinafter "Takano '0025586" or "Takano et al.>").

In item 10 on page 5 of the Action, claims 1-4 were rejected under the judicially created doctrine of obviousness-type double patenting as obvious over claims 1 and 6-8 of Takano et al. US 6,682,621 (hereinafter "Takano '621" or "Takano et al.>").

The above-noted references were cited in the Notice of References Cited and the IDS of March 17, 2005.

It is noted that Takano '621 is the issued patent of Takano '0025586. Accordingly, the references have the same disclosure. For this reason, the rejections are

addressed together below. Hereinafter, reference to "Takano et al." is intended to refer to both of the cited references, unless otherwise specified.

Applicants respectfully traverse these rejections as applied to new claims 5-7.

For the sole purpose of expediting prosecution and not to acquiesce to the rejection, claims 4-7 have been cancelled and replaced with new claims 5-7.

Takano et al. fails to anticipate or render obvious the present invention, because: (1) Takano et al. does not disclose or suggest each and every element of new independent claim 5; and (2) based on the teachings in the cited references and the knowledge in the art, it would not have been predictable to alter the teachings in the references to arrive at the present invention.

New independent claim 5 calls for a method of controlling plasma frequency of a high temperature superconductive tunnel junction. The method comprises disposing two single crystals of a high temperature superconductor on a substrate at an intersecting angle of the two single crystals in a range of 0 to 90 degrees, and bonding the two single crystals to form a high temperature superconductive tunnel junction in a bonded portion of the single crystals.

Takano et al. fails to disclose or suggest a method of controlling plasma frequency of a high temperature superconductive tunnel junction. Takano et al. only relates to forming a high temperature superconductive Josephson junction. Accordingly, Takano et al. fails to disclose each and every element of the present invention.

Further, Takano et al., in no way, suggests variation of plasma frequency of a high temperature superconductive tunnel junction or variation of plasma frequency, which is dependent on an intersecting angle of two single crystals of a high temperature superconductor. Takano et al. only discloses that Josephson current is controllable by changing a cross angle of the two single crystals of a high temperature superconductor. See paragraph [0034] of Takano '0025586, which corresponds to column 4, lines 39-45, of Takano '621. However, such a teaching does not suggest a plasma frequency controlling technique for a high temperature superconductive tunnel junction. Accordingly, the cited references simply fail to disclose or suggest that plasma frequency varies depending on an intersecting angle, and that plasma frequency can be controlled by

varying an intersecting angle of two high temperature superconductor single crystals to be bonded on the substrate.

In the discussion of the double patenting rejection at page 5 of the Action, the Office relied on Reference U (cited in the Notice of References Cited as K. K. Ng., Complete Guide to Semiconductor Devices. John Wiley & Sons, Inc., New York, 2002, pp. 570-573) as evidence that “it was known in the art that Josephson characteristic, *i.e.*, frequency is controlled by changing a cross angle of the high temperature superconductors.”

Applicants respectfully disagree with the Office’s position. Reference U is silent about any plasma frequency technique. In this regard, Reference U never mentions or suggests anything about controlling plasma frequency by changing a cross angle of the two high temperature superconductors. In fact, it is respectfully submitted that controlling plasma frequency of a high temperature superconductive Josephson tunnel junction by changing a cross angle of the two single crystals of a high temperature superconductor had not been known in the art field as one of Josephson characteristics before the present invention.

As such, it would not have been predictable to one of ordinary skill in the art, upon reading the cited references, to alter their teachings to arrive at the method of the present invention, as the cited references are silent about controlling plasma frequency by changing a cross angle of the two high temperature superconductors and such was not known in the art prior to the present invention.

Therefore, the invention of independent claim 5 is novel and nonobvious over Takano et al. ‘0025586 or Takano et al. ‘621 in view of reference U.

Claims 6-7 depend on claim 5, and thus, these claims are also novel and patentable over the cited references in view of their dependency on claim 5.

For these reasons, the above-noted anticipation rejection and the double patenting rejections are untenable and should be withdrawn.

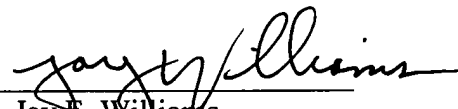
**VI. CONCLUSION**

In view of the foregoing amendments and remarks, it is respectfully submitted that the present application is in condition for allowance and early notice to that effect is hereby requested.

If the Examiner has any comments or proposals for expediting prosecution, please contact the undersigned attorney at the telephone number below.

Respectfully submitted,

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